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TRANSPORTATION AND HANDLING OF SEED

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BY REGIONAL COOPERATIVES IN THE SOUTHEAST

by Charlie B. Robbins

Farmer Cooperative Service
U.S. Department of Agriculture

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FARMER COOPERATIVE SERVICE
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Joseph G. Knapp, Administrator

The Farmer Cooperative Service conducts research studies and service activities of assistance to farmers in connection with cooperatives engaged in marketing farm products, purchasing farm supplies, and supplying business services. The work of the Service relates to problems of management, organization, policies, financing, merchandising, product quality, costs, efficiency, and membership.

The Service publishes the results of such studies; confers and advises with officials of farmer cooperatives; and works with educational agencies, cooperatives, and others in the dissemination of information relating to cooperative principles and practices.

This study was conducted under authority of the Agricultural Marketing Act of 1946 (RMA, Title II).

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Summary

This report covers a study of the seed operations of 7 regional wholesale cooperatives serving 13 Southeastern States. Most data are for the period 1956-60.

● Principal objective of the study was to determine possibilities for improving the transporting, handling, and warehousing of seed purchased and distributed by cooperatives and other firms in the South. Main findings for each major phase of operation follow:

Purchasing and Inbound Transportation

● Seventy-four percent of all seed received at the wholesale associations' warehouses came by truck and 26 percent, by rail.

● Of the truck receipts, 24 percent came from less than 50 miles; 35 percent came from 50 to 299 miles; 31 percent from 300 to 499 miles; and the remaining 10 percent moved 500 miles and over. For-hire carriers transported 40 percent of the seed trucked; association-owned trucks hauled 31 percent; trucks of other cooperatives hauled 17 percent; and farmer-owned trucks moved the other 12 percent.

● Seventy-eight percent of seed receipts by rail moved distances beyond 500 miles and another 20 percent came from distances of 300 to 499 miles. Indications were that seeds could be moved cheaper by trucks carrying 30,000-pound payloads up to a distance of about 850 miles without the benefit of backhauls.

● Only a small percentage of the seed purchased was shipped in pool cars, with orders by each retail cooperative to be delivered on stopovers or picked up from a central point. The seven regional associations did not pool any shipments because each had sufficient volume to buy in car or truck loads.

● Most associations were unable to use transit privileges available on specific seeds because their operations were confined to one or two States. Transit was used to a limited extent for lespedeza from the Midwest and for rye grass and vetch from the Pacific Northwest.

● Principal advantages reported for receiving seed by truck were faster service, more flexible and convenient operations, and lower rates for shorter hauls. Advantages of rail were lower rates for long hauls, more time for unloading, and associations could use transit and stopover privileges. Disadvantages of each method usually were listed as advantages for the other.

● The regional associations purchased an average of 135 million pounds of seed a year. Of these, 60 percent were field grains; 16 percent, small-seeded legumes; 4 percent, all other legumes; 14 percent, grasses; and 6 percent, hybrid seed corn.

● About one-half the seed was clean and one-half was rough (dirty or unprocessed) seed. The proportion of clean seeds ranged from 31 percent for hybird corn to 100 percent for legumes other than the small-seeded types.

● The associations obtained 50 percent of their total seed from local farmers, 5 percent from local and regional cooperatives, and 45 percent from wholesalers other than cooperatives. All rough seed came from farmers in the associations' trade areas. Eighty-six percent of the clean seed was obtained from proprietary wholesalers.

● About one-half of all seeds were purchased "f.o.b. shippers warehouse." Most seeds coming from the Midwest and Pacific Northwest were bought on this basis. The other one-half was locally produced seed bought on a "delivered to purchaser's warehouse" basis. The method varied widely among the seed categories, with transportation costs usually the deciding factor.

● Possibilities for improving the inbound transportation and purchasing of seed in the Southeast appear to be the following: (1) Explore possibilities of obtaining additional transit privileges for a larger group of seeds; (2) experiment with "piggyback" transportation of seed from the West; and (3) expand contracting programs with farmers in the Southeast to encourage production of seed for those crops that are adapted to the soil and climate of this area.

Processing

● Four associations operated central seed processing plants, and three others each operated more than one plant. Most plants were located in or near the area of heaviest seed production to eliminate hauling rough seed long distances.

● The seven associations processed an average of 73 million pounds of seed a year--or 54 percent of their receipts. They processed quantities equal to 103 percent of their hybrid corn receipts, 63 percent of field grains, and 46 percent of their small-seeded legumes. Field grains accounted for almost two-thirds of the total quantity processed.

Distribution and Outbound Transportation

● All seed the regional associations distributed to local outlets moved by truck because of the short distances and small quantities involved. Thirty-three percent of the seed went distances of less than 50 miles and 60 percent moved from 50 to 299 miles. The remainder was hauled from 300 to 500 miles.

● Association-owned trucks moved 50 percent of outbound shipments and local affiliates' trucks hauled 38 percent. Contract carriers moved 10 percent, and common carriers and farmers' trucks transported the remaining 2 percent.

● None of the seed association-owned stores sold directly to farmers was reported as pool shipments, and little was taken off the rail car or truck by farmers. Four associations made trucking allowances for picking up orders for seed at their plants.

● The regional associations distributed 65 percent of the 135.4 million pounds of seed they sold to about 350 local cooperatives and association-owned stores, 33 percent to 930 dealer agents, and the remaining 2 percent to other regional cooperatives and firms.

● Associations reported no possibilities existed for shipping seed in bulk to local outlets because State laws required seed offered for sale to be bagged and tagged.

● Principal advantages reported for moving out seed by truck were faster service, more flexible and convenient operations, and lower rates. Advantages of rail, each mentioned once by the associations were: it permitted use of transit, better control of seed movement, and larger shipments.

● More advance orders, better routing of trucks, and greater use of direct pooled car shipments and piggyback transportation to local outlets should reduce warehousing and outbound transportation costs.

General Transportation Aspects

● Five associations owned tractors and semitrailers with vans for hauling seed and other farm supplies; one owned semitrailers and leased tractors; and the other leased or contracted for complete units. Payload capacities ranged from 7 to 18 tons.

● Direct operating costs, other than labor, of the small tractors averaged 15 cents a mile; costs of the larger tractors averaged 21 cents a mile. Labor costs were 6 cents a mile for both.

● An average of 49 percent of the trucks moving seed into the associations' seed plants and warehouses obtained backhaul loads. Principal items backhauled were feed, fertilizer, and insecticides.

● An average of 32 percent of the trucks moving seed from association plants and warehouses had backhauls. Grain was the most frequent item backhauled.

● Associations that do not have sufficient trucks to handle most of their transportation needs should explore the feasibility of leasing such equipment. In four associations it appeared that establishment of transportation departments would improve seed operations.

Handling and Warehousing

● Forklift trucks were the main equipment the associations used for loading and unloading shipments in bags. Six of the seven associations reported their existing equipment was adequate.

● For handling bulk receipts of rough seed, four associations used pits with either air, bucket, or belt elevators; one used a portable pheumatic elevator; one used a portable auger elevator; and one used grain scoops. Four associations reported a need for additional elevators for unloading incoming bulk shipments.

● Most associations indicated they needed more bulk storage facilities. Possibilities of using tote boxes as bulk containers might be examined. Indications were that methods of handling in several warehouses could be improved with new modern buildings and power equipment.

Transportation and Handling of Seed by Regional Cooperatives in the Southeast

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Nearly every farmer in the United States purchases seed each year. Some of it may be grown and processed locally, requiring little transportation and handling. Much is produced and cleaned in specialized areas long distances from deficit areas where it is eventually planted.

This seed moves by railroads, trucks, and boats or barges to wholesale plants where some may be reprocessed and stored. Considerable quantities later move to retail dealers in less than rail car or truck loads and finally are distributed in small lots to individual farmers.

Seeds are marketed on either a rough or a clean basis. Some rough seeds are shipped long distances to processing plants, and transportation charges are paid on foreign materials. Others are processed in the areas where produced. Movement of seeds across State boundaries sometimes has required reprocessing to meet standards established by State laws.

The large number of types and varieties of seeds also presents problems in processing and warehousing or storing them. At the same time it is important that seeds be made available in good condition when farmers need them for planting. Transportation and handling costs in the various marketing and distribution stages make up a considerable portion of the total costs of the seed. Farmers cooperatives and other seed firms, therefore, are interested in research that may help keep such costs to a minimum.

Scope and Purpose of Study

This report is based on a study of the practices employed in purchasing and distributing seed by 7 regional farmer cooperatives that have a substantial wholesale and retail seed business in 13 Southeastern States. These were the principal regional associations operating in the area that included Maryland and West Virginia on the North and Arkansas and Mississippi on the West. All associations operated one or more processing plants and, in total, distributed seed to about

1,300 outlets. Most data on quantity or percentage of seeds handled cover the period 1956-60.

The objective of the study was to provide basic information that could be used by cooperatives and other firms purchasing and marketing seeds for patrons in the Southeast to improve their transportation, handling, and warehousing methods so as to reduce costs and provide more effective services for farmers.

The study endeavored to determine: (1) Volume and origin of seeds purchased and distributed; (2) extent of truck and rail shipments, distances moved, and ways inbound and outbound transportation costs might be reduced; (3) handling and warehousing methods used, especially for receiving seed in bulk and possibilities for improvement; and (4) possibilities for coordination among cooperatives and other firms in the Southeast in procuring seed from surplus producing areas, such as the West.

The report largely deals with the five major groups or categories of seed used most extensively in the Southeast. Small-seeded legumes, other legumes, grasses, field grains, and hybrid corn.[1] Few associations had records from which actual transportation costs could be determined; however, approximate transportation costs by truck and rail were available.

Purchasing and Inbound Transportation

Seedsmen require a great amount of technical knowledge to be able to purchase seed for maximum value to the farmer. The major regional cooperatives, therefore, have established seed departments staffed with trained personnel who are working closely with transportation men in purchasing and transporting seed needed by local associations and farmers.

Quantity and Kinds of Seed Purchased

The associations in this study purchased an average of 135 million pounds of seeds annually during the 1956-60 period (table 1). These purchases were based on detailed records of sales since the quantities of both averaged about the same over the 5 years.

Field grains accounted for 60 percent of total purchases, small-seeded legumes for 16 percent, grasses for 14 percent, hybrid corn for 6 percent, and other than small-seeded legumes for the remaining 4 percent.

Seeds as purchased by the cooperatives for their members were either clean and ready for planting, or they were rough (dirty or unprocessed) and required processing before use. Fifty-two percent of all seeds were clean and 48 percent were rough.

The proportion of purchases that were clean seed varied from 100 percent for other legumes to 31 percent for hybrid corn (table 2).

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[1]Small-seeded legumes included alfalfa, red clover, alsike clover, crimson clover, alice clover, button clover, sweet clover, Ladino clover, white clover, lespedeza, lupine, and Caley peas. All other legumes included Austrian winter peas, vetches, and cowpeas.

Grass seed included timothy, Kentucky bluegrass, ryegrasses, orchard grass, brome grass, bermuda grass, Sudangrass, redtop tall fescue, other fescues, crested wheat grass, Dallis grass, Bahia grass, and Rescue grass.

Field grain seed included wheat, oats, barley, sorghums, rye, soybeans, millet, and open pollinated seed corn.

Table 1. - *Average annual volume of seeds purchased by type and category, 1956-60*

Seed category	Clean	Rough	Total	Percentage of all seeds
	Million pounds			*Percent*
Small-seeded legumes	15.4	5.7	21.1	16
All other legumes	6.2	0	6.2	4
Grasses	16.0	3.3	19.3	14
Field grains	30.7	50.0	80.7	60
Hybrid corn	2.5	5.6	8.1	6
Total	70.8	64.6	135.4	100
Percent of total	52	48	100	-

Chief Sources and Areas of Origin

The regional wholesale cooperatives in the Southwest obtained seed from two main sources -- 50 percent from farmers and 45 percent from other wholesalers during the 1956-60 period (table 3). Wide variations occurred, however, in the sources of clean and rough seeds.

Clean Seed

The main source of clean seed was wholesalers. This source furnished 86 percent of all clean seed purchased by the associations in this study (table 4). By categories, they supplied 89 percent of all clean small-seeded legumes, 85 percent of all other legumes, 94 percent of grasses, 82 percent of field grains, and 74 percent of hybrid corn seed.

Farmers supplied a small quantity of clean seeds--4 percent. This seed consisted mostly of hybrid corn that had been custom processed by the farmers for use on their own farms or for sale at a later date.

Regional marketing cooperatives furnished 6 percent of clean seed purchases. Their volumes varied from less than one-half of 1 percent for hybrid corn to 15 percent for all other legumes. These sales sometimes were seed in surplus

Table 2. - *Percentage of purchases of clean and rough seed, by categories, 1956-60*

Seed category	Clean	Rough	Total
		Percent	
Small-seeded legumes	73	27	100
All other legumes	100	0	100
Grasses	83	17	100
Field grains	38	62	100
Hybrid corn	31	69	100
Total	52	48	100

Table 3. - *Chief sources of total seeds, by category, 1956-60*

Seed category	Local sources		Regional sources		Total
	Farmers	Marketing cooperatives	Marketing cooperatives	Seed wholesalers	
			Percent		
Small-seeded legumes	5	0	1	10	16
All other legumes	0	0	1	3	4
Grasses	2	0	0	12	14
Field grains	38	2	1	19	60
Hybrid corn	5	0	0	1	6
Total	50	2	3	45	100

supply as a result of being produced in the locale, or as a result of overbuying, either from overestimating demand or farmers' intentions to plant.

Local marketing cooperatives supplied only 4 percent of clean seed purchases. These seeds were confined to the field grains handled as a service provided for members by a few local associations. Some locals operated small processing plants with equipment for one or two specific crops and provided custom cleaning service for their patrons. In the event a patron had a surplus of seed, the local cooperative would provide a market and often resell within its trade area. When the local market for a specific seed became saturated, the local associations would market it through their regional association.

Rough Seed

Farmers within each individual association's trade area supplied all of their rough seed receipts. As indicated in table 2, farmers supplied 69 percent of the associations' hybrid corn in rough or unprocessed form, 62 percent of the field grains, 27 percent of the small-seeded legumes, and 17 percent of the grasses.

To meet the increasing demand from farmers to deliver their seed in bulk,

Table 4. - *Chief sources of clean seed, by categories, 1956-60*

Seed category	Local sources		Regional sources		Total
	Farmers	Marketing cooperatives	Marketing cooperatives	Seed wholesalers	
			Percent		
Small-seeded legumes	1	0	10	89	100
All other legumes	0	0	15	85	100
Grasses	1	0	5	94	100
Field grains	5	10	3	82	100
Hybrid corn	26	0	0	74	100
Total	4	4	6	86	100

associations equipped most plants with either portable elevators or pits and elevators to permit receiving seed in bulk. Data were not available, however, on the quantity of bulk seed received. Further comments on handling and warehousing are included in the last section of this report.

Areas of Origin

Seed production in the Southeast is inadequate to supply the demand. This situation requires in-shipments from specialized seed producing areas in other parts of the country. Most crops grown in the Southeast are adapted for seed production there, but in many cases quality is affected by disease and climatic conditions which cause inferior seeds unsuited for planting. This is especially true for various legumes and grasses.

The principal seeds imported from other areas by the cooperatives included in the study were small-seeded legumes, other legumes, and some grasses. Seeds for field grains were usually produced in each Southeastern State but occasionally it became necessary to supplement local supply from adjoining States. Hybrid corn was usually produced in the State in which it was used.

Methods of Purchase

Seeds were purchased by two methods: (1) F.o.b. shipper's warehouse, which accounted for 49 percent of all seed purchases, and (2) delivered to purchaser's warehouse, which accounted for the remaining 51 percent (table 5). The method of purchasing varied between associations, areas of supply, and in some cases with individual seeds.

In most cases, those seeds coming from the Midwest and the Pacific Northwest were purchased f.o.b. the shipper's warehouse, while those produced in the local areas were purchased on a "delivered to purchaser's warehouse" basis. One association, however, made practically all its purchases on a delivered basis.

Forty-three percent of all field grains were purchased f.o.b. the supplier's warehouse while 57 percent were purchased on a delivered basis. Oats accounted for the bulk of the delivered purchases since they were the main seed in the field grain category. As indicated

Table 5. - *Methods of purchase of total seeds, by category, 1956-60*

Seed category	Basis of purchase		Total
	F.o.b. shipper's warehouse	Delivered to purchaser's warehouse	
	Percent		
Small-seeded legumes	57	43	100
All other legumes	100	0	100
Grasses	78	22	100
Field grains	43	57	100
Hybrid corn	8	92	100
Total	49	51	100

in table 3, the associations purchased 62 percent of all field grains seed from farmers in rough form. In most cases the farmer delivered these purchases to the association's processing plant at the time of sale. On rare occasions the association bought grains on the basis of a sample furnished by the farmer and took delivery on the farm, thus purchasing on an f.o.b. basis.

The same situation prevailed for the other seed categories with purchases made on a delivered basis. The majority of such purchases, consisting of locally produced seeds, was delivered to the association's processing plant by the farmers.

The advantage of each method of purchasing varied from association to association. The determining factor was overall cost. If one supplier could deliver seed cheaper than the association could purchase it from another supplier and transport the seed with its own trucks, then purchases were made on a delivered basis. However, if the association could buy and transport seed with its trucks at a lower cost, or if the shipper would arrange for transportation, purchases were made f.o.b. supplier's warehouse.

The advantage cited most frequently for purchasing f.o.b. supplier's warehouse was lower transportation costs whenever the association could arrange for backhauls.

The advantages cited most frequently for purchasing on a delivered basis were:

1. Better job by supplier of arranging for transportation and getting shipments out.

2. Savings on freight because supplier can get delivery cheaper than association can move seed with its own trucks.

3. Legal advantages when quality is not up to purchase contract.

The advantage of one method over the other was determined, therefore, by the situation existing at each individual association. The most economical method for an association that did not own or operate any transport trucks could easily be the most expensive for one that did.

The associations' transportation managers and truck operators were alert for backhaul movements, which often enabled them to reduce transportation costs for seed considerably below those for a one-way haul.

Extent of Truck and Rail Inbound Shipments

The movement of seed from processing plants or warehouses to distributors, both wholesale and retail, is often done when time is an important factor. The interval between harvest in one area and planting in another is relatively short, and excessive delay enroute often might mean a loss to the distributor as well as to the farmer.

If the distributor--wholesaler or retailer--does not have the necessary seed on hand before planting starts, he will miss sales during the period when the bulk of the seeds are sold. If the farmer is forced to delay planting, he can easily suffer loss from poor stands, late maturing crops, or no crops.

These reasons cause shippers and buyers to utilize the fastest mode of transportation available, even if the rates by this mode are somewhat higher. The

Table 6. - *Percentage of receipts by truck and distance of movement, by seed category, 1956-60*

Seed category	Receipts by truck	Distance of movement				
		Under 50 miles	50-299 miles	300-499 miles	500 miles and over	Total
	Percent	*Percent*				
Small-seeded legumes	53	5	24	49	22	100
All other legumes	22	8	25	25	42	100
Grasses	59	8	26	48	18	100
Field grains	83	30	39	28	3	100
Hybrid corn	100	26	36	10	28	100
Total	74	24	35	31	10	100

added transportation costs, if any, are more than offset by the reduction of time in transit.

Truck Shipments

Seventy-four percent of all seed receipts of the seven southeastern regionals during the 5 years under study were received by truck, compared with 26 percent by rail (tables 6 and 7 and figure 1). This difference was reported to be caused by the longer time required to receive shipments by rail. Trucks could be dispatched on short notice and travel the most direct route, thereby eliminating time lost in transit from indirect routing and stopovers.

The most extensive use of trucks was for trips from 50 to 299 miles, which accounted for 35 percent of truck receipts; but shipments from distances from 300 to 499 miles accounted for 31 percent. Twenty-four percent came from less than 50 miles, and the remaining 10 percent from 500 miles and over (figure 2).

All hybrid corn was received by truck, and 83 percent of the field grain, 59 percent of the grasses, 53 percent of

Table 7. - *Percentage of receipts by rail and distance of movement, by seed category, 1956-60*

Seed category[1]	Receipts by rail	Distance of movement				
		Under 50 miles	50-299 miles	300-499 miles	500 miles and over	Total
	Percent	*Percent*				
Small-seeded legumes	47	0	4	22	74	100
All other legumes	78	0	0	2	98	100
Grasses	41	0	0	4	96	100
Field grains	17	0	2	31	67	100
Total	26	0	2	20	78	100

[1]No hybrid corn was shipped by rail.

Figure 1.

Percentages of Seed, Inbound Shipments by Truck and Rail and by Type of Seed, 1956-60

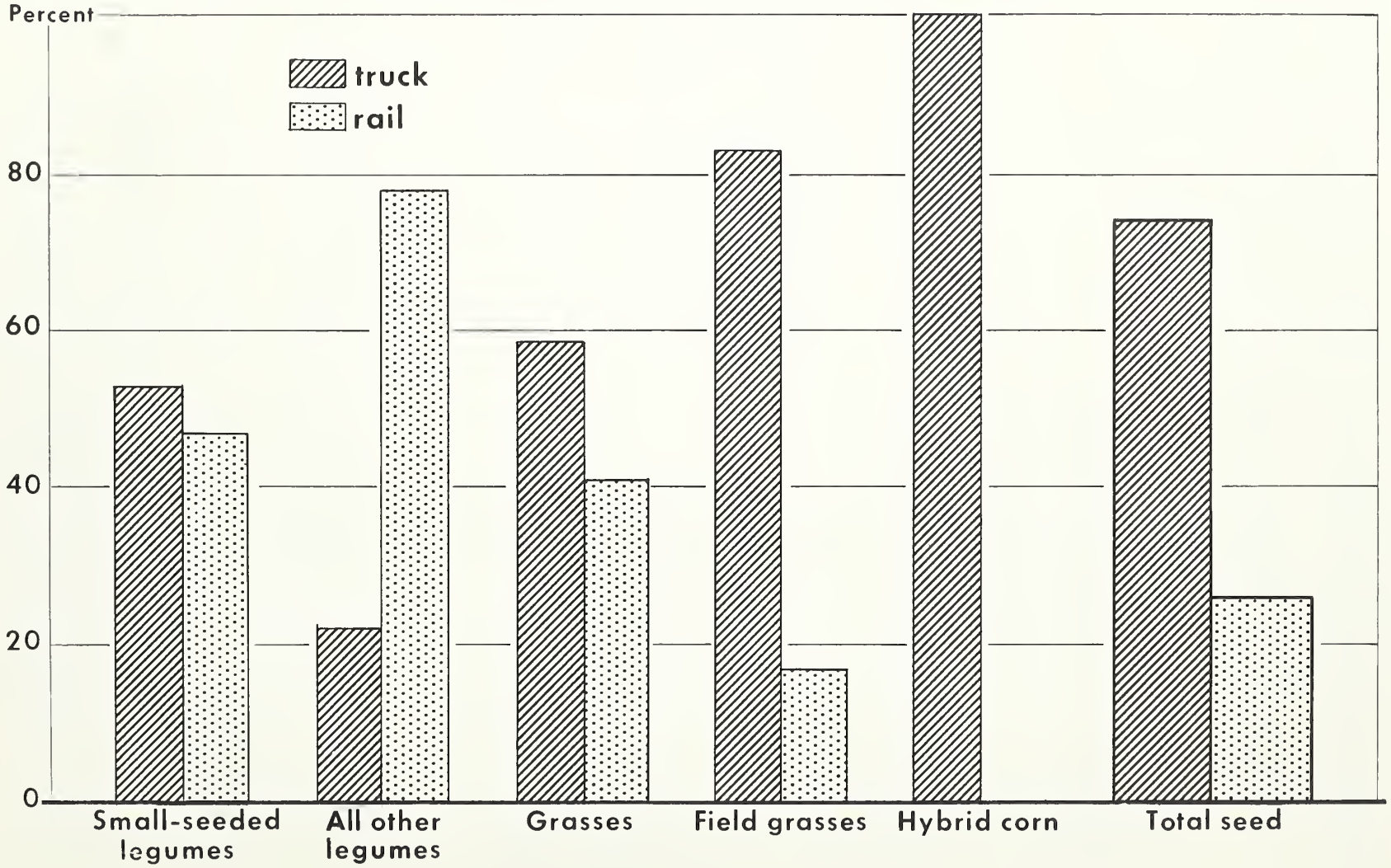
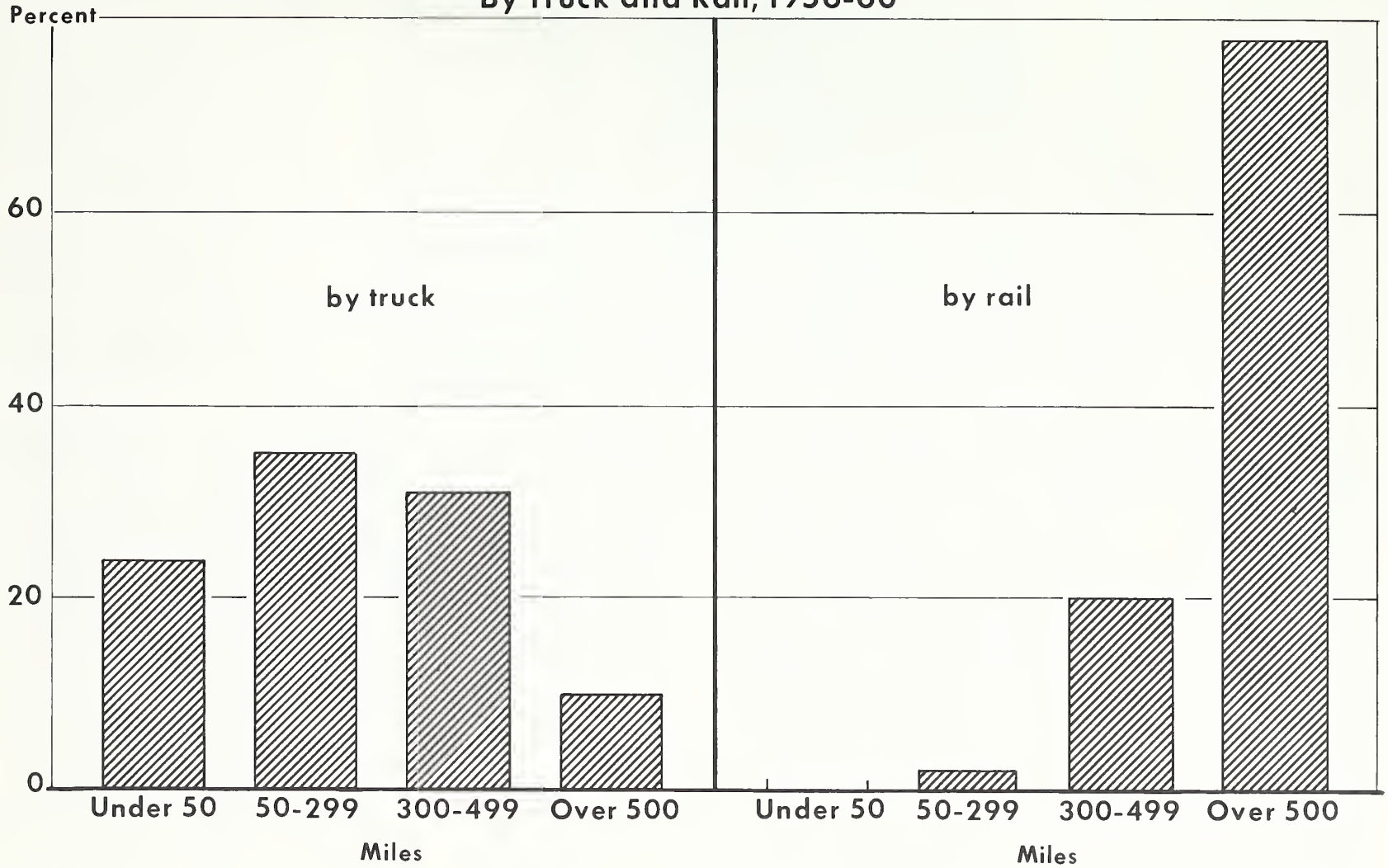


Figure 2.

Percentages of Total Seed, Inbound Shipments on Basis of Distance, By Truck and Rail, 1956-60



the small-seeded legumes, and 22 percent of all other legumes were brought in by trucks.

Carriers for hire, contract and common, transported 40 percent of the incoming seed moved by truck. Trucks not for hire--the buyers' owned or leased vehicles--hauled another 31 percent. Trucks owned by seed marketing cooperatives hauled 17 percent, and farmers who produced the seeds hauled 12 percent with privately owned vehicles.

When regional associations used their own trucks to haul seed to their warehouses, three associations assessed transportation charges to local farmers or cooperatives on a mileage basis, and three assessed them on a ton-mile basis. Such information was not obtained for the seventh association.

Rail Shipments

The most extensive use of rail was for distances beyond 500 miles, which accounted for 78 percent of all seed receipts by rail. Twenty percent were from distances of 300 to 499 miles, and the remaining 2 percent came from 50 to 299 miles.

Highway mileage, rail rates, truck costs on a round-trip basis, and rail advantage or disadvantage over trucks in 1961 for 10 specific seeds from areas of origin to 7 destinations in the Southeast are shown in table 8. These seeds comprise the largest percentage of imports into the Southeast and are in deficit supply in many localities in that area.

This comparison of transportation costs indicated, for example, that a 60,000-pound car of alfalfa seed could be moved by rail from Sacramento, Calif., to Atlanta, Ga.--a distance of 2,528 miles--at a rate of $2.01 a hundred pounds in 1961. A 30,000-pound payload could be moved this distance by truck, with operating expenses of 28 cents a mile, at a cost of $4.72 a hundred pounds. Therefore, rail movements of 60,000-pound payloads of alfalfa seed had a $2.71 per hundredweight advantage over truck movements of 30,000-pound payloads from California to Georgia.

A comparison of transportation costs for clover seed indicated that a 60,000-pound car could be moved by rail from Portland, Ore., to Richmond, Va--a distance of 2,911 miles--at a rate of $2.11 a hundred pounds. A 30,000-payload could move this distance by truck, with operating expenses of 28 cents a mile, at a cost of $5.43 a hundred pounds. This shows that rail movements of 60,000-pound cars of clover seed have an advantage of $3.32 a hundred pounds over truck movements of 30,000-pound payloads from Oregon to Virginia.

This advantage varies for the various seeds and between different points in the Southeastern States from a 37-cent advantage for truck shipments of fescue from Kansas City, Mo., into the Little Rock, Ark., area, to an advantage of $3.36 for rail shipments from Portland, Ore., into the Raleigh, N. C., area.

This situation is true only for extremely long distances. For example, comparison of transportation costs from Oklahoma City, Okla., to Atlanta, Ga.--a distance of 871 miles--reveals that a 30,000-pound car of alfalfa seed would move by rail at a rate of $1.64 a hundred pounds. Trucks could move a 30,000-pound payload 871 miles, with an operating expense of 28 cents a mile, for a cost of $1.63 a hundred pounds.

This example assumed that trucks transported a minimum of 30,000 pounds and were, or could be, operated for a cost of 28 cents a mile. Truck costs were computed on a round-trip basis, but with only a one-way haul.

On the basis of these assumptions, seeds could be moved cheaper by trucks carrying 30,000-pound payloads up to a distance of about 850 miles without the benefit of revenue from backhauls. The amount of backhaul secured would determine the extended mileage that trucks can move seeds at a lower cost than they can be moved by rail. The distances trucks can operate at lower costs than trains would also be affected by an increase or decrease in payloads above or below the 30,000 pounds used for compiling the costs in table 8.

Advantages and Disadvantages of Receiving Seed by Truck and by Rail

This section indicates some of the reasons why the associations used different modes of transportation for inbound shipments of both clean and rough seed. All rough seeds were hauled short distances by truck, usually within a radius of 50 miles. Advantages and disadvantages of each mode of transportation as reported by the associations are summarized in table 9.

Truck Advantages

Faster service for shorthauls and small shipments was given as an advantage of trucks by all associations. Trucks were used for emergency shipments when speed was important, especially for replenishing inventories.

Lower rates were reported as an advantage for shipments from under 600 to 700 miles. Transit privileges were not available for all rail shipments and on short hauls.

Five associations stated that with trucks, direct deliveries could be made to their door and that receiving and unloading was easier than by rail. Two said trucks could handle small loads and be rerouted after leaving the warehouse.

Truck Disadvantages

The necessity for unloading trucks upon arrival was most frequently reported as a disadvantage. Personnel had to be pulled from other jobs to unload trucks, often causing delays in other operations.

Danger in transit from torn and wet seed and higher rates in long hauls also were listed.

Rail Advantages

Lower rates for shipments from 600 to 700 miles was reported as the main advantage of rail. In some shipments--usually those from the Pacific Northwest--transit privileges resulted in lower rates.

More time for unloading was listed as an important advantage when the associations were utilizing relatively small working forces in their warehouses and processing plants.

Stopover shipments were listed as an advantage for associations with more than one distribution warehouse. By sorting a rail car to different warehouses and unloading part of its contents at each, inventories could be replenished without handling the seed an additional time.

Table 8. - *Highway miles, rail rates, and truck costs per hundred pounds, and rail advantages or disadvantages for specific seeds between points indicated, 1961*

Seed	From	To Atlanta, Ga.				To Decatur, Ala.				To Jackson, Miss.				To Little Rock, Ark.			
		High-way miles	Rail rate	Truck cost[1]	Rail advan-tage	High-way miles	Rail rate	Truck cost[1]	Rail advan-tage	High-way miles	Rail rate	Truck cost[1]	Rail advan-tage	High-way miles	Rail rate	Truck cost[1]	Rail advan-tage
			Cents per 100 pounds				*Cents per 100 pounds*				*Cents per 100 pounds*				*Cents per 100 pounds*		
Alfalfa	Sacramento, Calif.[2]	2,528	201	472	+271	2,329	172	435	+263	2,172	144	405	+261	2,005	144	374	+230
	Topeka, Kans.[3]	901	166	168	+02	719	142	134	-08	736	144	137	-07	470	115	88	-27
	Oklahoma City, Okla.[3]	871	164	163	-01	672	136	125	-11	584	127	109	-18	348	98	65	-33
	Phoenix, Ariz.[2]	1,859	201	347	+146	1,660	172	310	+138	1,461	144	373	+229	1,336	144	249	+105
Clovers	Sacramento, Calif.[2]	2,528	201	472	+271	2,329	172	435	+263	2,172	144	405	+261	2,005	144	374	+230
	Portland, Oreg.[2]	2,697	201	503	+302	2,519	172	470	+298	2,471	151	461	+310	2,260	151	422	+271
	Boise, Idaho[2]	2,251	201	420	+219	2,073	172	387	+215	2,025	151	378	+227	1,814	151	239	+88
Vetch and winter peas	Portland, Oreg.[2]	2,697	201	503	+302	2,519	172	470	+298	2,471	151	461	+310	2,260	151	422	+271
Rye grass	Portland, Oreg.[2]	2,697	201	503	+302	2,519	172	470	+298	2,471	151	461	+310	2,260	151	422	+271
Fescue	Portland, Oreg.[2]	2,697	201	503	+302	2,519	172	470	+298	2,471	151	461	+310	2,260	151	422	+271
	Kansas City, Mo.[3]	829	159	155	-04	651	136	121	-15	671	139	125	-14	405	112	75	-37
Sudan	Sacramento, Calif.[2]	2,528	201	472	+271	2,329	172	435	+263	2,172	144	405	+261	2,005	144	374	+230
	Austin, Tex.[3]	960	168	179	+11	830	153	155	+02	543	122	101	-21	510	115	95	-10
Millet	Phoenix, Ariz.[2]	1,859	201	347	+146	1,660	172	310	+138	1,461	144	373	+229	1,336	144	249	+105
	Austin, Tex.[3]	960	157	179	+22	830	142	155	+13	543	113	101	-12	510	106	95	-11
Grain sorghum	Phoenix, Ariz.[2]	1,859	192	347	+155	1,660	192	310	+118	1,461	144	373	+229	1,336	124	249	+125
	Austin, Tex.[4]	960	157	179	+22	830	142	155	+13	543	113	101	-12	510	[3]106	95	-11
Lespedeza	Kansas City, Mo.[3]	829	159	155	-04	651	136	121	-15	671	139	125	-14	405	112	75	-37
	Indianapolis, Ind.[3]	530	123	99	-24	421	105	79	-26	659	132	123	-09	574	119	107	-12

Table 8. - *Highway miles, rail rates, and truck costs per hundred pounds, and rail advantages or disadvantages for specific seeds between points indicated, 1961 (continued)*

Seed	From	To Nashville, Tenn.				To Raleigh, N. C.				To Richmond, Va.			
		High-way miles	Rail rate	Truck cost[1]	Rail advan-tage	High-way miles	Rail rate	Truck cost[1]	Rail advan-tage	High-way miles	Rail rate	Truck cost[1]	Rail advan-tage
		Cents per 100 pounds				*Cents per 100 pounds*				*Cents per 100 pounds*			
Alfalfa	Sacramento, Calif.[2]	2,358	172	440	+268	2,842	211	531	+320	2,826	211	527	+316
	Topeka, Kan.[3]	647	135	121	-14	1,167	199	218	+21	1,174	196	219	+23
	Oklahoma City, Okla.[3]	708	142	132	-10	1,258	203	235	+32	1,347	208	251	+43
	Phoenix, Ariz.[2]	1,696	172	317	+145	2,246	211	419	+208	2,335	211	436	+225
Clovers	Sacramento, Calif.[2]	2,358	172	440	+268	2,842	211	531	+320	2,826	211	527	+316
	Portland, Oreg.[2]	2,443	172	456	+284	2,927	211	547	+336	2,911	211	543	+332
	Boise, Idaho[2]	1,997	172	373	+201	2,481	211	463	+252	2,465	211	460	+249
Vetch and winter peas	Portland, Oreg.[2]	2,443	172	456	+284	2,927	211	547	+336	2,911	211	543	+332
Rye grass	Portland, Oreg.[2]	2,443	172	456	+284	2,927	211	547	+336	2,911	211	543	+332
Fescue	Portland, Oreg.[2]	2,443	172	456	+284	2,927	211	547	+336	2,911	211	543	+332
	Kansas City, Mo.[3]	575	126	107	-19	1,097	191	205	+14	1,104	187	206	+19
Sudan	Sacramento, Calif.[2]	2,358	172	440	+268	2,842	211	531	+320	2,826	211	527	+316
	Austin, Tex.[3]	869	159	162	+03	1,367	208	255	+47	1,500	220	280	+60
Millet	Phoenix, Ariz.[2]	1,696	172	317	+145	2,246	211	419	+208	2,335	211	436	+225
	Austin, Tex.[3]	869	147	162	+15	1,367	193	255	+62	1,500	205	280	+75
Grain sorghum	Phoenix, Ariz.[2]	1,696	192	317	+125	2,246	209	419	+210	2,335	214	436	+222
	Austin, Tex.[4]	869	147	162	+15	1,367	193	255	+62	1,500	205	280	+75
Lespedeza	Kansas City, Mo.[3]	575	126	107	-19	1,097	191	205	+14	1,104	187	206	+19
	Indianapolis, Ind.[3]	294	89	55	-34	638	142	119	-23	622	136	116	-20

[1] Truck costs are based on 30,000-pound payload, 28 cents per mile operating cost, and round trip mileage.
[2] Lowest rail rate for 60,000-pound car.
[3] Lowest rail rate for 30,000-pound car.
[4] Lowest rail rate for 40,000-pound car.

Table 9. - *Advantages and disadvantages reported for receiving seed by truck and by rail*

Advantages	Cooperatives reporting	Disadvantages	Cooperatives reporting
		Truck	
Faster service	7	None reported	2
Lower rates for short hauls	7	Must unload upon arrival	3
More flexible and convenient	6	More damage in transit	2
Less damage	1	Higher rates for long hauls	1
		Rail	
Lower rates for long hauls	5	Delays in transit	6
More time for unloading	3	Higher rates for short hauls	4
Can use transit and stopover privileges	2	Less flexible and convenient	1
Less damage in transit	2	More damage in transit	1

Rail Disadvantages

Delays in transit were reported by six associations. Time lost in transit is important to seed firms because it can easily mean a loss through changes in price and a loss of sales due to depleted inventories. Higher rates for short hauls--especially those under 500 miles--made up the other principal disadvantage.

Use of Pool-Car Shipments and Transit Privileges

In four regional associations, orders from local retail cooperatives for out-of-State seeds were assembled and held until a carload could be purchased. The car was then shipped to a central point where the locals picked up their orders. In some cases shipments had one or two stopovers before reaching the regionals' central warehouses. This method of operating saved handling costs, both in warehousing and transportation.

The extent of the use of pool-car shipments and savings from them could not be ascertained because records were not maintained in detail. The associations indicated that whenever possible, orders were pooled, but the estimated proportion of overall purchases bought on this basis ranged from 5 to 25 percent.

There was no pooling of orders for seeds among the seven regional cooperatives included in this survey. In all cases their seed requirements were great enough for purchases in car or truck loads.

Coordinated ordering can be done for those seeds that carry the same rate for two or more points by requesting a stopover at the time the order is placed. The shipper specifies the stopovers on the bill of lading. This can be done on shipments in direct line of transit with a small stopover charge for points that have different rates and are in direct line of transit, but the stopover point has to pay the higher rate.

Transit privileges were available on specific seed moving into the Southeast, but most associations were unable to

take advantage of them because most of their operations were confined to one or two States and shipments usually were unloaded at one central warehouse. Few direct pool shipments were made to locals. A storage and processing in-transit privilege was being utilized to a limited extent on lespedeza seed moving from the Midwest. The only other use made of any transit privilege was for specific seeds with relatively high minimum weight limits per rail car and relatively low freight rates. Examples were rye grass and vetch coming from the Pacific Northwest.

Production Contracts

To be assured of a partial supply of certified seeds six of the seven associations found it necessary to contract for seed production. These contracts covered practically all small grains produced in the different States as well as some small-seeded legumes, grasses, and hybird corn. Average receipts from contract producers for the 5-year period varied from about 300,000 pounds to 20.7 million pounds and averaged 12.2 million pounds. The volume comprised 2 to 37 percent of total receipts and averaged 15 percent for the group.

Seeds were produced under the supervision of the seed improvement associations of the various States and fieldmen of the regional cooperatives. If seed met the requirements for certification, farmers were paid a premium above uncertified seed prices. All seeds produced under contract were bought by the associations even though they exceeded anticipated requirements.

The practice of taking all the production helped the associations acquire a sufficient number of producers to insure a relatively constant supply of a few varieties of locally produced seeds. The associations disposed of any surplus by selling it to associations in adjoining States and to other seed houses in the area.

Possibilities for Improvement

Cooperatives in the Southeast might consider the following as ways of improving purchasing and inbound transportation of seed:

1. Explore possibilities of obtaining additional transit privileges for a large group of seeds. If the associations are to continue importing seed from other areas, additional transit privileges that apply to a large group of seeds should reduce the overall transportation costs.

2. Experiment with piggyback transportation. This method of transportation has been used successfully in shipping over long distances. It is more flexible than rail car movements and could be used for shipments with two or more destinations. This would enable cooperatives to service two or more warehouses from one order with a minimum of handling. Indications were that one or more seed marketing cooperatives in the West were interested in experimenting with the piggyback system.

Piggyback could possibly result in a lower overall cost even if transportation or freight charges were higher than for straight rail cars. This lower cost could result from less handling required for placing seeds in wholesale or retail warehouses.

3. Expand contracting programs with farmers in the Southeast. If farmers could produce more seed for those crops

that are adapted to the soil and climate of the Southeast, this should ease the deficit seed production situation and reduce transportation costs for moving seed into the area. Such a program would also benefit local farmers by providing them with an additional source of income and enabling them to graze crops suitable for this purpose before harvesting the seed.

Processing

All associations in the study operated processing plants. Their operations included cleaning, recleaning, packaging, and reprocessing processed seed where shrinkage or loss of germination had occurred.

The principal reasons for undertaking processing were to know the origin and characteristics of the seed, to maintain and control quality, to reduce costs, and to provide a market for locally produced seed. Large-scale processing was impractical for local affiliates because their volume of seed was too small to justify large expenditures for processing equipment and facilities.

Many cooperatives also found it necessary to establish testing laboratories and to employ seed analysts on a full-time basis in order to assure the quality of seed they purchased. These analysts have enabled the associations to perform additional services for their patrons that resulted in substantial savings even though these were difficult to evaluate in monetary terms.

Some of the States were slow in establishing standards to be met before seeds could be offered for sale. Cooperatives helped to get adequate legislation enacted to protect seed distributors and farmers from inferior seeds banned from sale in adjoining States.

Quantity Processed

The quantity of seed processed by the associations in the Southeast depended to a large extent on seed production in the area. In some States, specialized crops are produced in surplus. Cooperatives in these States purchased, processed, and marketed these seeds or processed them on a custom basis. This additional service helps many farmer patrons improve their income from seed production.

As a result of custom operations, some associations processed a larger proportion of their total receipts than others did. Total receipts include seed for sale to local cooperatives for retailing, to other wholesale cooperatives and seed dealers, and seed brought to plants for custom processing.

The seven regional associations in this study processed an average of about 73 million pounds of seed a year from 1956-60 (table 10). This was equal to 54 percent of their combined receipts, including seed processed on a custom basis. Records showed only total pounds of each seed processed; therefore the quantity that was custom processed could not be determined. Field grains accounted for almost two-thirds of the total quantity processed. The associations processed about two-thirds of their field grain seed receipts.

Table 10. - *Average annual volume of seed processed, by category, 1956-60*

Seed category	Pounds	Percent of total
	Million	*Percent*
Small-seeded legumes	9.7	13
All other legumes	0.7	1
Grasses	3.3	5
Field grains	50.9	70
Hybrid corn	8.3	11
Total	72.9	100

The average proportions of total seed receipts processed by the seven cooperatives, according to five seed categories, in 1956-60 were as follows:

Type	Percent
Small-seeded legumes	46
All other legumes	11
Grasses	17
Field grains	63
Hybrid corn	[1]103
All seed	54

[1]The excess over 100 percent of receipts was due to custom operations.

The proportion of receipts processed ranged from 14 percent to 83 percent among the associations. Proportions of seed receipts by categories processed ranged from 11 percent for "other legumes" to 103 percent for hybrid corn.

Several associations processed more than their receipts because of custom services performed. Association B processed a quantity of seed equal to 140 percent of its hybrid corn receipts. The extra 40 percent was custom processed for a commercial seed house in the area. Association C processed 132 percent of its legume receipts, other than the small-seeded types. This extra legume seed was locally produced vetch processed on a custom basis for the farmers. The association purchased it from local producers on a clean seed basis for resale through their local associations. Association D processed 6 percent more field grains, and Association C processed 60 percent more small-seeded legumes than they purchased because of custom cleaning for members.

Factors Influencing Plant Locations

Most processing plants of the regional cooperatives in the Southeast were located in or near the area of heaviest seed production. This eliminated the need for hauling rough seed long distances and resulted in lower seed costs to farmer purchasers. Such locations generally were satisfactory for transporting seeds to distribution outlets.

Processing plants are located in or near the main farm supply warehouses or in branch warehouses of the regional cooperatives. This arrangement was satisfactory because such warehouses provided, in most cases, storage for processed seed. Also it permitted better use of personnel. Employees can be shifted between different jobs without difficulty as the work load demands. This arrangement seems to work rather

well because all personnel are familiar with the complete operation and able to fit in where needed.

Investments in Buildings and Plant Equipment

Investments in facilities varied between associations, depending on the size of plants and the job designed for them to do. Six of the seven associations housed their plants in their farm supply warehouses, thus making it difficult to accurately obtain building costs applicable to the seed plants.

Costs of the combined seed and farm supply warehouses and processing equipment ranged from $75,000 to $2.3 million. Three associations had seed processing equipment costing from $25,000 to $65,000; the cost in one was $125,000; in one was $340,000; and in another was $670,000. Data for the seventh association were not available.

Three associations operated more than one seed processing plant. These were primarily designed for a specific seed or group of seeds produced in the area. The other four associations operated central plants with all necessary equipment for any cleaning job to be done. In addition, some local member associations of the four regionals operate small plants that process small grains and small seed legumes.

All associations indicated their plants are equipped with necessary machinery for processing all seeds produced in their areas. Some plants have old unused machines that have been supplemented with new equipment. In some instances these machines are retained, on a standby status, for emergency use in the event the workload becomes too great for the newer machines.

Equipment found in one plant, selected at random, for processing regular field seeds and hybrid corn consisted of the following:

Item	Number
369-D cleaner (7-screen)	3
Disc separator	2
Scarafier	1
20-roll dodder mill	2
Gravity table	2
Corn grader	1
Length grader	1
Sheller (1,500 bu. per hour)	1
Seed dryer, 350-bu. bins	6
Bucket elevator	8
Cup elevator	2
Belt conveyer	2

The initial capital outlay necessary to equip this plant was $63,000. This equipment had been installed over a period of 4 years, 1948-51. Six of the 10 field-seed machines were installed in 1951, resulting in this plant being modern for all practical purposes.

Distribution and Outbound Transportation

When seeds arrive in the regional wholesale cooperatives' warehouses, distribution begins. Seeds are sold and moved to local outlets for ultimate distribution to farms in their respective areas. This task involves use of transportation that must be arranged by either the regional association or local outlet.

Quantities and Kinds of Seeds Distributed

Field grains comprised the largest category of seeds distributed by the seven regional associations. They represented an average of 60 percent of the total during the period 1956-60. Next in importance were small-seeded legumes representing 16 percent; grasses, 14 percent; hybrid corn, 6 percent; and other legumes, 4 percent (table 11). No attempt was made to obtain unit prices and dollar values of the various seeds distributed.

Total farm supply sales for the seven associations averaged approximately $170 million with seed sales representing an average of slightly over $14 million, or 8.4 percent for the period 1956-60. Estimated cash expenditures by farmers for seed in the 13 States served by these 7 cooperatives averaged $101.5 million a year. Retail sales of seed by all cooperatives averaged $35 million, or 34.5 percent of the potential for the period.

Types of Distribution Outlets

Retail seed outlets of the associations in this study included 350 local cooperatives and association-owned stores and 930 dealer agents. These in turn supplied farmer-patrons. The importance of each group varied with the individual association, as indicated in table 12. The seven regional associations distributed 48 percent of their total seed through local cooperatives, 33 percent through dealer agents, and 17 percent through association-owned stores. The remaining 2 percent represented sales to other regionals, and in one case to another seed house in the area.

None of the seed sold directly to farmers was reported as pool shipments.

Table 11. - *Average annual seed volume distributed by seven Southeastern regional cooperatives, by categories, 1956-60*

Association	Categories					Total
	Small-seeded legumes	All other legumes	Grasses	Field grains	Hybrid corn	
			Million pounds			
A	5.0	.7	2.8	6.5	.2	15.2
B	1.6	1.8	1.6	6.6	2.0	13.6
C	.6	.5	.5	1.6	.1	3.3
D	1.9	1.2	2.6	7.7	.6	14.0
E	1.8	.5	3.3	15.4	1.3	22.3
F	8.5	.8	6.9	37.5	3.7	57.4
G	1.7	.7	1.6	5.4	.2	9.6
Total	21.1	6.2	19.3	80.7	8.1	135.4
			Percent			
Percent of total	16	4	14	60	6	100

Table 12. - *Proportion of total seed distributed, and proportion of sales to various types of outlets, by seven regional cooperatives in the Southeast, 1956-60*

Association	Proportion of total distribution	Proportion of cooperatives' distribution to:				
		Other regional co-ops	Local co-ops	Dealer agents	Own stores	Other
		Percent				
A	11	5	95	0	0	0
B	10	2	95	0	0	3
C	4	0	85	15	0	0
D	7	0	0	15	85	0
E	17	10	0	25	65	0
F	45	0	44	56	0	0
G	6	0	75	25	0	0
Total or average	100	2	48	33	17	(1)

[1]Less than 0.5 of 1 percent.

Very little seed was taken off the rail car or truck by farmers.

The regional associations assisted their local affiliates in disposing of slow-moving and overstocked seeds. This was done when a local reported that its stock of a specific seed was not moving. If the regional had a demand for the seed, it would pick up and transfer it to other associations that had requested an additional supply.

Extent of Truck and Rail Outbound Shipments

The seven regional cooperatives shipped out by truck 89 percent of the seed they distributed (table 13). Movements by truck varied slightly between the different seed categories, ranging from 88 percent of field grains to 95 percent of "other" legumes. Such truck shipments, however, represented the

Table 13. - *Truck outbound shipments of seed and distance of movement by seed category for seven Southeastern regional cooperatives, 1956-60*

Seed category	Shipments by truck	Distance of movement				
		Under 50 miles	50-299 miles	300-499 miles	500 miles and over	Total
	Percent	*Percent*				
Small-seeded legumes	89	28	61	10	1	100
All other legumes	95	33	62	5	0	100
Grasses	89	36	57	7	0	100
Field grains	88	32	62	6	0	100
Hybrid corn	89	46	49	5	0	100
Average	89	33	60	7	0	100

entire volume of seed physically distributed from regional wholesale cooperative warehouses to local outlets. All these outbound shipments moved from centrally located warehouses, and distances were not great enough and quantities large enough to effectively utilize rail transportation.

Of the outbound shipments of seed by truck to local cooperative outlets, 33 percent went distances of less than 50 miles, 60 percent moved from 50 to 299 miles, and the remaining 7 percent moved from 300 to 499 miles (figure 3).

Four of the seven associations made trucking allowances for picking up seed orders at their plants. The amounts were $2 a ton, $3 a ton, 3 1/2 cents a ton-mile, and $5 a ton on corn only.

The associations indicated there were no possibilities of shipping seed in bulk to local outlets. State laws required seed offered for sale to be bagged and tagged. One cooperative stated that bulk shipments would not be practical because the seed could be bagged during the cleaning or processing operation.

Movements by rail amounted to 11 percent of total sales. They were composed entirely of pool car shipments from distant sources direct to local outlets, thus bypassing the regional cooperatives' warehouses.

Types of Motor Carriers Used

Distribution of seed from the regional cooperatives' warehouses to the local associations was done primarily by two types of motor carriers. The regionals' own trucks moved 50 percent of the outbound shipments, and their local affiliates' trucks hauled 38 percent. Contract carriers were third in importance with 10 percent of outbound shipments. The other 2 percent was equally divided between common carriers and farmers' trucks.

One association preferred contract carriers to owning trucks. Movements by this type carrier accounted for about 4 percent of the 10 percent moved by contract carriers. The other 6 percent was divided between two other associations that used contract carriers to supplement their own trucks during peak seasons.

Three of the seven associations made trucking allowances to local cooperatives and dealers for picking up orders for seed at their plants or warehouses. One other made such an allowance only for seed corn.

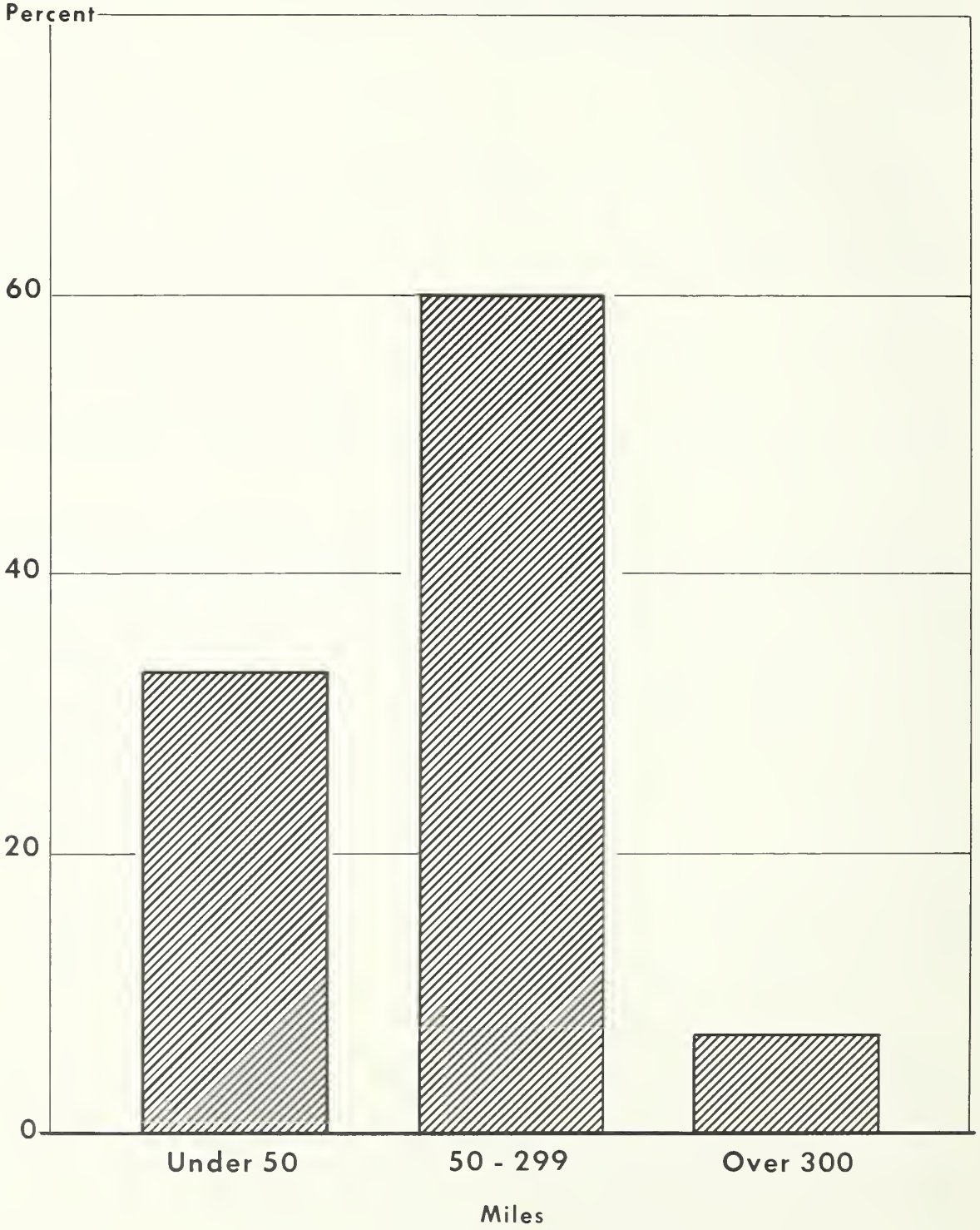
Some regionals operated trucks over established routes in making scheduled deliveries of orders previously placed by the local associations' stores, or dealer agents. Other regionals delivered supplies to local outlets when orders from two or three made up a truck load. In some instances, local outlets arranged for their trucks or other trucks to pick up orders at the regionals' warehouses. These methods of arranging transportation have worked to the satisfaction of all concerned.

Advantages and Disadvantages of Shipping Out Seed by Truck and by Rail

In the South, railroads do not extend to all the small towns and many other towns are served by branch lines that have only one or two trains a week. Trucks can travel the most direct routes and make deliveries that would be impossible to make by rail. Advantages and

Figure 3.

Percentages of Total Seed, Outbound Shipments on Basis of Distance, by Truck, 1956-60



disadvantages of each mode of transportation are summarized in table 14.

Truck Advantages

Faster service was listed by all the associations as an advantage of trucks because of the short distances and small loads involved. They believed it impractical, from the standpoint of service, to ship seed by rail to the local associations.

Trucks were considered more flexible and convenient because they could be operated on scheduled routes and make door-to-door deliveries to local outlets. Lower rates were reported by five associations.

Truck Disadvantages

Four associations indicated no disadvantages of trucks. One said that during the peak of rush season, one truck could not haul complete orders to individual associations; thus two or more trips were required. Another stated that during rush seasons, trucks sometimes arrived at irregular hours for their second load, thus making it impossible to schedule shipments from the regional's warehouse.

Rail Advantages

Four associations reported no advantages for rail on outbound shipments. Four advantages each were listed once (table 14).

Rail Disadvantages

Higher rates were mentioned three times due to the short distances that shipments moved. Some associations stated that delays in transit often extended over several days. One regional reported that an average of 4 days was required to get a shipment by rail to a local association 135 miles away.

Table 14. - *Advantages and disadvantages of shipping out seed by truck and by rail*

Advantages	Cooperatives reporting	Disadvantages	Cooperatives reporting
		Truck	
Faster service	7	None reported	4
More flexible and convenient	7	Pay load is too small	1
Lower rates	5	Difficult to schedule loading due to irregularity of trucks	1
Better control of seed movement	2	More damaged bags and seeds	1
		Rail	
None reported	4	Higher rates	3
Cars can be loaded at own convenience	1	Delay in transit	3
Can ship in larger quantities	1	Minimum shipment too large for single outlets	2
Transit can be used	1		
Better control of seed movement	1		

Possibilities for Improvement

Possibilities for improvements in the handling and outbound shipment of seed appeared to be limited. Obtaining more advance orders so as to better route trucks would improve efficiency. The associations reported that they could not ship seed in bulk to local outlets because State laws required seed offered for sale to be bagged and tagged.

If more direct shipments of pooled cars to local outlets were possible and if piggyback transportation could be developed for moving seed into the area, warehouse handling and outbound transportation costs could be reduced.

General Transportation Aspects

Transportation costs have increased in importance as seed production has become more specialized in areas distant from those where seed is planted. Surplus and deficit areas have developed that rely upon various modes of transportation to move farm commodities to the market-place and production supplies to the farms.

This situation prompted many regional cooperatives to establish their own transportation departments and acquire necessary equipment. However, some associations still depend on common carriers for long hauls. Many local cooperatives also have acquired trucks for transporting seed and other products to plants and supplies back to their retail warehouses.

Equipment Owned and Operated

All associations included in this study owned or controlled some transportation equipment. Practically all used this equipment for transporting other farm supply items in addition to seed. Some associations found it necessary to supplement their equipment with for-hire trucks during peak seasons. This type of operation has enabled them to function with a minimum investment in transportation equipment.

Five of the seven associations owned tractors and semitrailers with vans; one owned the semitrailer and leased the tractors; and the other leased or contracted for complete units. The payload capacity varied from about 7 tons to 18 tons. The initial cost or investment averaged about $11,000 per unit.

In some associations the seed departments controlled the trucks they used, while in others all trucks were controlled by the transportation departments. All associations used van-type trucks for transporting seed and other supply items because of the protection afforded from weather while in transit.

Operating Costs

Operating costs for the small tractors operated by the regional associations averaged 15 cents a mile with labor excluded, and 21 cents a mile with labor costs included. The average costs for the larger tractors was 21 cents a mile with labor excluded and 27 cents with labor included.

Labor costs were 6 cents a mile for both categories of tractors. The wage scale in this area was reported to be somewhat lower than in the Midwest and the Northeast.

Availability of Backhaul for Inbound and Outbound Trucks

Regional cooperatives arranged for return loads whenever possible for those trucks operated by the local outlets and their farmer patrons when they delivered seed to the regionals' plants.

Five associations reported an average of 49 percent of all trucks hauling inbound shipments obtained backhauls. The range was from 15 to 90 percent.

Major items moving on backhauls from seed plants were farm supplies such as feed and fertilizer. Insecticides also were hauled on a seasonal basis. The trucks with highest proportion of backhauls were able to serve a nearby fertilizer plant and grain elevator.

Wide variations also existed for backhauls by outbound trucks moving seed from the warehouses of the regional associations. The percentage with backhauls ranged from none to 80 percent, with an average of 32 percent. Two associations reported that their outbound trucks returned empty. In one this came about as a result of local association trucks moving all outbound shipments of supplies. In the other, distribution was done over established routes with trucks operating on a schedule. These routes were set up in such a way that they usually terminated near their points of origin. Since these two situations eliminated the need for backhaul traffic, the associations were not concerned with it.

The usual item available for backhaul for those outbound trucks moving seed from regional warehouses was grain moving back to elevators or into feed mills as feed ingredients. On many occasions, seeds coming into the plants and warehouses were backhaul for trucks of regional and local associations moving supply items to the locals.

Possibilities for Improvement

Associations in this study should continually look for ways of increasing backhauls for their trucks, and for those of their local affiliates that haul seed either inbound or outbound. The extent to which trucks had backhauls varied widely in this study, but conditions change from time to time. Use of backhauls or routing trucks so that they finish unloading near points of origin help reduce per unit transportation costs.

Cooperatives that do not own or operate a sufficient number of trucks to handle their transportation needs might explore the possibilities of leasing such equipment. Lease arrangements can provide transportation equipment without a large capital outlay. One association with a large seed volume used this plan satisfactorily.

Four cooperatives do not have a transportation department. All should consider establishing one. In many cases a trained transportation manager can save an association considerably more than his salary by auditing its transportation bills and recovering overcharges, and by preventing costly transportation mistakes.

The number of times seed is handled and the method employed affects operating costs. A warehouse not built for use of forklift trucks requires the use of hand trucks and results in increased labor costs.

The availability of storage space affects the overall job of purchasing and distributing by a wholesale or retail warehouse. If space does not permit building a rush season inventory that will supply a large part of the seasonal demand, emergency purchases will be necessary to replenish exhausted items.

Available space also affects seed processing efficiency. If space does not permit storage of both rough and clean seed, a difficult problem is created. The plant may not be able to continue operating until the processed seed can be moved out. When rough seeds are stored in bags, they can be replaced by clean seeds stored in bags as processing proceeds, but processing has to stop when working from bulk bins unless storage space is available for cleaned seeds.

Four associations reported that existing equipment was adequate for all phases of their seed operation. Each of the remaining five associations reported a need for additional equipment for handling seed.

Equipment Used and Needed for Handling Seed

This section includes comments on equipment used and needed for bagged and for bulk seed.

Equipment for Bagged Seed

Equipment used for loading and unloading shipments in bags was predominantly forklift trucks. An exception was the use of hand trucks in one plant and warehouse. The warehouses of six associations were structurally capable of supporting and utilizing forklift trucks, thus permitting fuller utilization of warehouse space. In one association's warehouse, the inability of workmen to stack bags high by hand caused considerable storage space not to be utilized.

For unloading incoming shipments in bags, six associations reported their equipment was adequate; the seventh could not use forklift trucks in all warehouses.

In loading outgoing shipments, six associations reported that existing equipment was adequate. Some warehouses of the remaining association had been in use for a number of years and were not constructed for the use of forklift trucks.

For storing seed, equipment of all associations was adequate except for one which had old warehouses that would not permit the use of forklift trucks.

Equipment for Bulk Seed

Faced with increasing production costs, farmers found that labor requirements could be greatly reduced by eliminating the bagging operation and delivering their seeds to the plants in bulk. All associations in the study faced with the demand for bulk receiving facilities, therefore, equipped most existing plants with either portable elevators or pits and elevators.

All associations received incoming shipments of rough seed in bulk in one or more of their plants. Four associations used pits with either air, bucket, or belt elevators; one used a portable pneumatic elevator; one used a portable auger elevator that extended into the truck; and the other one used grain scoops.

Five associations reported they needed additional equipment for handling bulk rough seeds, but their warehouses would first have to be remodeled for bulk handling. Four reported a need for additional elevators. Farmers' demand for bulk receiving was reported to be increasing with each new crop harvested.

Warehouse Space Available and Needed for Storing Seed

This section includes comments on warehousing space needed and used for bagged and bulk seed.

Warehouse Space for Bagged Seed

Six associations had processing plants located in their general farm supply warehouses, thus utilizing the same storage space alternately for seed and general supplies. The remaining association had constructed a new seed plant and warehouse building for seed storage. It preferred this arrangement over its former combination seed plant and general warehouse.

One association had ample storage space for all seeds and other supply items carried in its regular inventory plus any additional needed for rush seasons. Other associations were not as fortunate and experienced a shortage of storage space during the peak of their rush season inventory buildup.

The warehouse space used for bagged seed storage varies with the season, and no attempt was made to determine the square feet of floor space used for this purpose. Four of the seven associations appeared to have sufficient warehouse storage space to operate effectively when all seeds were bagged at the combine. The other three have proposed programs that include additional warehouse facilities.

Warehouse Space for Bulk Seed

Most of the associations' plants did not have storage facilities for bulk seeds. Some had surge bins, however, for unloading and holding seeds until they could be bagged for storing and processing.

There was need for storage bins for various varieties of seeds, and some associations had plans underway to construct them.

The conditions that exist in the seed industry in the Southeast make the costs of a complete bulk receiving and distributing operation almost prohibitive. Small-scale seed producers market small lots of numerous varieties whose identities must be maintained at all times. To do this in a bulk operation requires a considerable number of storage bins.

Such bins could either be added to seed plants, or tote boxes that require mechanical handling could be used. In the Southeast, either type of bin would require protective cover for the stored seed. Additional bins could be installed on the upper levels of multifloor plants and used for gravity feeding of cleaning machines. Tote boxes, if used as bulk containers would require additional warehouse space for storing seeds. After seeds were processed, such boxes might

be stored outside with less expensive cover and release warehouse space for other storage.

Possibilities for Improvement

It appears that most associations could improve their seed handling and warehousing by adding more bulk storage facilities. Additional equipment for handling bulk rough seed also would be helpful, but some warehouses in the study will need to be replaced with new modern buildings that can make use of such equipment.

Possibilities of using tote boxes might be examined for bulk handling. However, their use would require additional warehouse space in some of the associations.

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Liquid Fertilizer Distribution by Local Cooperatives in the Pacific Northwest, General Report 95. B. H. Pentecost.

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Farmers Buy Supplies Cooperatively, Bulletin Reprint 3. J. Warren Mather.

Credit Control in Selected Retail Farm Supply Cooperatives, Area IV (Kansas, Nebraska, Missouri, Iowa, Illinois, and Southern Wisconsin), General Report 57. T. R. Eichers.

Inventory Management by Selected Retail Farm Supply Co-ops, Area VI (New York, New Jersey, Virginia, West Virginia, North Carolina, and Georgia), General Report 70. John M. Bailey.

Manufacture of Fertilizer by Cooperatives in the South, FCS Bulletin 13. Warren K. Trotter.

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Statistics of Farmer Cooperatives, 1959-60, General Report 103. Anne L. Gessner.

Handbook on Major Regional Cooperatives Handling Farm Production Supplies, 1958 and 1959, General Report 89. J. Warren Mather.

Integrated Feed Operations Through Farmer Cooperatives, 1959, General Report 100. Anne L. Gessner.

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